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Submitted to **Law Commissions' consultation on Automated Vehicles: A Preliminary Consultation Paper**
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Chapter 3: Human factors

Consultation Question 1: Do you agree that:

Agree

Please share your views below::
But see later comments that the UIC will effectively be the driver.

Agree

Please share your views below: :

Agree

Please share your views below: :

Consultation Question 2: We seek views on whether the label "user-in-charge" conveys its intended meaning.

Please share your views below::
No, it should be "driver" to convey the importance of the role and conditions above.

Consultation Question 3: We seek views on whether it should be a criminal offence for a user-in-charge who is subjectively aware of a risk of serious injury to fail to take reasonable steps to avert that risk.

Other

Please share your views below::
If the UIC is the driver then this is already covered by law. With a level 5 vehicle, a UIC will not be necessary.

Consultation Question 4: We seek views on how automated driving systems can operate safely and effectively in the absence of a user-in-charge.

Please share your views below: :

Level 5 vehicles will still have challenges detecting hazards and so will default to "safe" modes of operation which could have impacts on traffic networks in early mixed fleets that may then be hazardous. Eg human overtakes a stopped level 5 CAV in a dangerous place, human passes past level 5 CAV at junction as perceives vehicle is stopped. Most of the google car accidents are caused by human drivers not understanding what a CAV did (often stopped unexpectedly)

Consultation Question 5: Do you agree that powers should be made available to approve automated vehicles as able to operate without a user-in-charge?

Agree

Please expand on your answer: :

For specific use cases and road networks, and note that otherwise there is no business case for a CAV (work, watch movie, eat etc).

Consultation Question 6: Under what circumstances should a driver be permitted to undertake secondary activities when an automated driving system is engaged?

Please share your views below: :

Only when travelling in a Level 5 vehicle.

Consultation Question 7: Conditionally automated driving systems require a human driver to act as a fallback when the automated driving system is engaged. If such systems are authorised at an international level:

No

Please expand on your answer below::

No, as they may not be able to take over in time. The only case is if the vehicle is stopped and hands over.

Please share your views below: :

Any and all, if the vehicle stops and hands over.

Chapter 4: Regulating vehicle standards pre-placement

Consultation Question 8: Do you agree that:

Agree

Please explain your answer: :

Agree

Please explain your answer: :

Agree

Please explain your answer::

The role and funding of DVSA/ DVLA should be reviewed as it would be better that all vehicle certification and safety is overseen by one body.

Consultation Question 9: Do you agree that every automated driving system (ADS) should be backed by an entity (ADSE) which takes responsibility for the safety of the system?

Agree

Please explain your answer: :

But system must be " system of systems" NOT just the vehicle , eg also include the roads and road communications. It is also essential that the responsibilities are tied into insurance arrangements so that those suffering damage or injury are compensated.

Consultation Question 10: We seek views on how far should a new safety assurance system be based on accrediting the developers' own systems, and how far should it involve third party testing.

Please share your views below: :

Third party testing is the norm for many critical systems, and will be needed to verify many use cases that would appear on UK roads, after a level of self-certification.

Again, extending the role of DVSA seems like a logical approach, but also given the seismic shift and rapid advance of CAVs, it makes sense that a third party should be overseen and directed by a board representing the public, motor vehicle manufacturers/ADSEs, insurance companies, highway authorities, police and emergency services.

Consultation Question 11: We seek views on how the safety assurance scheme could best work with local agencies to ensure that it is sensitive to local conditions.

Please share your views below: :

We agree with the need to adapt to local conditions which vary across the UK. We agree that CAVS must learn hyper local conditions (LSE has written a paper about how driving conditions vary across the UK so CAVS must adapt (<http://blogs.lse.ac.uk/psychologylse/2016/01/25/the-ripple-effect-of-driving-behaviour/> and <http://www.lse.ac.uk/business-and-consultancy/consulting/consulting-reports/autonomous-vehicles-negotiating-a-place-on-the-road>), and the LAMBDA -V project has explored local roads issues).

But there are over 150 Local Highway Authorities in the UK, plus Highways England. They do not at present have the resources to fix potholes or broken traffic signals. So, a central team of experts to co-ordinate the "Digital Highway Code" we later describe could manage most of the work and deal with local practitioners, but we emphasise that roads, and roads authorities, are not ready for autonomous vehicles by any means.

The trouble with disruptive technologies is that they cut across everything and ignore established institutions and practices.

The UK is eager to be seen as a leader in CAVs which opens up the potential for taking greater risks with safety and lives.

See Question 10, where our answer goes some way to suggesting that all stakeholders somehow need to be represented in order that the nation gets ready for CAVs.

The views of the HSE, ROSPA and other safety organisations will be important.

It's also true that the CAV challenge is bringing out issues that should be dealt with anyway, especially relating to maintenance, potholes, and signing.

Chapter 5: Regulating safety on the roads

Consultation Question 12: If there is to be a new safety assurance scheme to authorise automated driving systems before they are allowed onto the roads, should the agency also have responsibilities for safety of these systems following deployment?

Yes

Please explain your answer::

Systems again must include road, not just vehicles.

(1) regulating consumer and marketing materials?, (3) roadworthiness tests?

Please explain your answer::

Regulating consumer and marketing materials - because of the "autopilot" lesson.

Roadworthiness tests - including roads.

Yes, extend to advanced driver assistance systems

Please explain your answer: :

With the same notes as above.

Also, it should be clear that any design change or modification that affects safety should be approved before it can be rolled out. In principle non-compliant vehicles could be immobilised, or downgraded from, say, level 5 to level 4 until the problem is resolved.

Consultation Question 13: Is there a need to provide drivers with additional training on advanced driver assistance systems?

Yes

Please explain your answer: :

Yes, as no-one ever reads instructions! It needs to be part of the Digital Highway Code, as the sat nav now is.

Other

Please explain you answer::

Maybe.

Consultation Question 14: We seek views on how accidents involving driving automation should be investigated.

Please share your views below::

Please share your views below: :

No, it should investigate all CAV accidents, not just high-profile ones.

No, this should not be left to police forces, as the skills required are wide. Police do not investigate accidents in Marine or Aviation or Rail.

Consultation Question 15:

Agree

Please explain your answer: :

Yes, monitor advanced driver assistance system accident rates

Please share your views below :

Yes, as they can have hidden behaviours especially in interaction with human drivers.

Consultation Question 16:

Please share your views below :

Sample size is a challenge. Early CAV data will be a small number of vehicle kilometres, while human drivers have a big sample. Statistics will be muddled here by just one accident. Also, CAV accidents have far more data than human accidents with human accidents consistently underreported since records began.

Please share your views below::

No, human accidents need more investigation as promoted by the RAC. eCall offers a new data set currently untapped in the UK.

New obligations to report accidents would be helpful since a damage only accident between a CAV and a human vehicle might go unreported but next time the same systemic faults may cause a fatal crash.

Chapter 6: Civil liability

Consultation Question 17: We seek views on whether there is a need for further guidance or clarification on Part 1 of Automated and Electric Vehicles Act 2018 in the following areas:

Other

Please explain your answer: :

No comment

Other

Please explain your answer::

No comment

Please share your views below: :

No comment

Consultation Question 18: Is there a need to review the way in which product liability under the Consumer Protection Act 1987 applies to defective software installed into automated vehicles?

Other

Please explain your answer below: :

No comment

Consultation Question 19: Do any other issues concerned with the law of product or retailer liability need to be addressed to ensure the safe deployment of driving automation?

Please share your views below: :

Yes, for roadside infrastructure and communications to the vehicle.

Please also note re Chapter 6:

Although Chapter 6 is titled Civil Liability, it does not directly address a range of Civil Traffic Offences. They are covered to some extent in other chapters, but we suggest the following should be more closely examined:

- Parking:
 - o On street
 - o Car parks
 - o Private land
- Bus lanes
- Illegal manoeuvres e.g. box junctions

Chapter 7: Criminal liability

Consultation Question 20: We seek views on whether regulation 107 of the Road Vehicles (Construction and Use) Regulations 1986 should be amended, to exempt vehicles which are controlled by an authorised automated driving system.

Other

Please explain your answer::

This is an interesting question. Our initial thoughts were "Of course the act should stay the same, the CAV should have the engine stopped and a parking brake applied if someone isn't in it, in terms of saving fuel/electricity and reducing air quality issues". However, deeper thinking into an 'On-demand fleet' use case of CAVs would mean that a vehicle in the fleet that is not currently being used is likely to circle popular areas until a user requests the CAV. This has been written in academic papers to be the likely way on-demand fleets are used to reduce the need for parking in the city centre, so that the space can be used for other means

such as shopping, offices, or flats. However, we think Local Authorities are unlikely to accept this extra traffic and it is also wasted energy. See <https://www.oregon.gov/ODOT/Programs/CAV%20documents/AV-ODOT-Use-Cases-for-Automated-Vehicles.pdf> Therefore, we think regulation 107 would need to be changed to cater for this type of use case.

The use case of 'on-demand fleets' is being trialled in California and big companies such as Google and Uber are big influencers, with significant investment. Therefore it is likely to happen.

The argument is made even stronger by the use cases of freight delivery by CAV and automated public transport.

Technology can help: Additionally, it could be considered that the vehicle should record and maintain a log of all events which should be available for inspection / duplication by the authorities in the event of a suspected infraction. This relates to other questions about data storage times etc. Sufficient cameras are likely to be on board so can be considered as an enhancement over the vehicle being attended by a human driver.

In areas where there is good network availability vehicle event recordings can be safely uploaded to an event (evidence) storage server so that it will be held safely and securely.

Consultation Question 21: Do other offences need amendment because they are incompatible with automated driving?

Other

Please explain your answer::

Potentially. Answering this question competently involves a review of all 109 relevant Acts.

Consultation Question 22: Do you agree that where a vehicle is:

Yes

Please explain your answer :

The full benefits of CAVs, and conceivably the market can only be fully realised when SAE Level 5, full automation, becomes a reality.

- SAE Levels 1-3, there will be a person, either in full control or responsible for the safe operation of the vehicle.
- SAE Level 4 is more difficult to define, but so long as the vehicle is working in its "operational design domain" the human user cannot be the driver until control has been accepted/ handed back. Logically it should be required that an audit trail is maintained to demonstrate who/what is/was in charge.

When considering the long term, it's important to think about one of the greatest positives of AVs, that people would be mobile who cannot drive, are not of age to drive or are too elderly to drive, so in this situation they would not be considered a driver and it would be unfair to consider (for example) a 10-year-old child, a driver for the purposes of criminal offences.

So, providing the vehicle is capable of driving itself and the driving system is correctly engaged human users or occupants of the vehicle cannot be held liable.

If there were an accident, questions could be raised as to whether the correct operation of the vehicle had somehow been interfered with or a situation contrived where an accident is likely. Therefore, there should be sufficient monitoring and recording through in-built cameras and sensors to provide evidence that the vehicle was fully automated with the system engaged. This does imply that occupants of AVs would have to sacrifice some privacy.

Additionally, to show that the vehicle was not interfered with from outside footage from built-in cameras and sensor should also be recorded. Therefore, laws regarding use of CCTV in public spaces must be adhered to – it should be considered whether current legislation relating to CCTV will require amendments to enable AVs to be used safely. GDPR will have an impact here.

Consultation Question 23: Do you agree that, rather than being considered to be a driver, a user-in-charge should be subject to specific criminal offences? (These offences might include, for example, the requirement to take reasonable steps to avoid an accident, where the user-in-charge is subjectively aware of the risk of serious injury (as discussed at paragraphs 3.47 to 3.57)).

Please share your views below::

Responses to other questions relating to the user-in-charge should be referred to. It is clear from the consultation paper that there are many views . We cannot wholly support the concept of a user-in-charge. In principle any occupant of a level 4 AV could find themselves nominated as a user-in-charge, or may be drunk, underage etc.

Key to this is that 3.55 states "The role of user-in-charge only applies where vehicles are driving themselves at SAE Level 4." We agree that a user-in-charge should never be needed for SAE Level 5 vehicles. We do not have a strong opinion for Level 4 vehicles but would point out that in most cases the role of the user-in-charge and driver are so similar that it is not worth attempting to differentiate the two.

Also, SAE level 4 covers vehicles where "the driving automation features can perform all driving tasks within their 'operational design domain'". The operational design domain is likely to be very varied across different makes and models of vehicles and hence the role of the user-in-charge will need to be equally varied.

We think the user-in-charge is an unnecessary complication and suggest that it would be better to consider the role and responsibilities of the driver under each of the relevant conditions before "approving" a level 4 AV.

With regard to taking necessary steps to avoid an accident we respectfully suggest that responsibility should be placed on any citizen in any place, provided they are aware of the situation and that steps can be taken to avoid an accident. As the consultation paper points out it needs to be demonstrated that such persons were subjectively aware. In the context of the driver/ user-in-charge of a Level 4 AV we suggest that sufficient camera and detector technology should be included in the vehicle to log the driver's actions plus surrounding activities/ environment before and after all relevant situations, e.g.:

- When control is hand back by the vehicle
- When the vehicle places itself into a minimal risk condition.
- When the vehicle is entering or leaving its operational design domain.
- When the vehicle takes back control form the driver

Consultation Question 24: Do you agree that:

Agree

Please explain your answer below :

Yes. In many instances the relevant data will be in the Cloud/ Server associated with the vehicle. Why do the police need authorisation? We suggest that the NIP should require data to be retained and not altered in any way. To this end it is desirable that police should at least be able to obtain a checksum or other validation code to verify that the data has not been altered.

Agree

Please explain your answer below :

In principle we would support this. Unless stated otherwise we assume that the regulatory authority should be under the DVSA.

Agree

Please explain your answer below :

Again, in principle, we agree with this. It is important to consider why the event occurred.

- If the ADS has not been modified or amended since it was approved plus it incorporates all known and approved updates, then clearly the ADSE did not knowingly cause an infraction. In this case we would suggest that the law should support and encourage a cooperative approach between the ADSE and the regulator to improve the ADS and prevent future problems.
- On the other hand, if the ADSE changed the ADS and did not seek the consent and/or approval of the regulator then regulatory sanctions should apply.

Agree

Please explain your answer below::

In principle we agree that a range of sanctions should apply. However, imposing sanctions may be complex and there could be unforeseen consequences.

- The ADSE and the ADS itself could have been developed by a non-UK organisation.
- The pace of change and innovation is such that the ADSE may have been transferred or sold on to another organisation.
- The ADS may not have been approved at all, although in that instance it is arguable that the owner and the original vendor are fully liable for all consequences.

Consultation Question 25: Do you agree that where a vehicle is listed as only safe to drive itself with a user-in-charge, it should be a criminal offence for the person able to operate the controls (“the user-in-charge”):

(1) not to hold a driving licence for the vehicle;; (2) to be disqualified from driving;; (3) to have eyesight which fails to comply with the prescribed requirements for driving;; (4) to hold a licence where the application included a declaration regarding a disability which the user knew to be false;; (5) to be unfit to drive through drink or drugs; or, (6) to have alcohol levels over the prescribed limits?

Please tick all relevant boxes above and explain your answers below :

In principle we would agree. However, as identified elsewhere, we question whether the role of user-in-charge is useful. We see this as simply a “driver”.

Consultation Question 26: Where a vehicle is listed as only safe to drive itself with a user-in-charge, should it be a criminal offence to be carried in the vehicle if there is no person able to operate the controls?

No

Please explain your answer below :

Would the person(s) being carried necessarily know that the vehicle requires a user-in-charge? Surely it should be required that a user-in-charge/driver must interact with vehicle in some way before it will move. This means either level 5, or drivers.

Consultation Question 27: Do you agree that legislation should be amended to clarify that users-in-charge:

Other

Please explain your choice :

Agree, if the user-in-charge role is retained as distinct term, which we counsel against.

Consultation Question 28: We seek views on whether the offences of driving in a prohibited place should be extended to those who set the controls and thus require an automated vehicle to undertake the route.

Please share your views::

Some liability should lie with those who set the controls, as in essence a decision is being made by the control-setter and they are responsible for this decision. But to what extent they are liable for the offence is another question.

Sat nav routes following prohibited roads are not relevant as the driver is in charge.

Consultation Question 29: Do you agree that legislation should be amended to state that the user-in-charge is responsible for:

(1) duties following an accident;; (2) complying with the directions of a police or traffic officer; and, (3) ensuring that children wear appropriate restraints?

Please tick any relevant boxes above and explain your answers below::

As stated elsewhere, our view would be that there is very little difference in the responsibilities of a user-in-charge and a driver. Any amendments made to the legislation should apply equally to the driver and user-in-charge.

Consultation Question 30: In the absence of a user-in-charge, we welcome views on how the following duties might be complied with:

Please share your views below: :

This question is particularly relevant to SAE Level 5, full automation, which does not require a user-in-charge.

In the event of any detected event that could result from an accident or injury or damage, the AV should come to a safe stop, as required in the Highway Code.

A significant difficulty will be in determining liability when there is no user-in-charge.

For level 4 and below, we suggest that the driver and the user-in-charge have the same responsibilities. Therefore, our responses below relate solely to level 5.

(1) As discussed in the consultation paper, the level 5 AV could be carrying passengers, or it could be going to park or collect passengers without anyone on board. We agree with the last statement in para 7.79 "An alternative approach would be to postpone consideration of the issue until after highly automated vehicles have completed road trials and are ready to be put on the market, at which stage we will have more understanding of the practical issues."

In the short-term we suggest that the AV certification and approvals process should include demonstration that adequate measures are in place to replicate any duties of a human driver relating to safety and following an accident.

(2) As noted on the public consultation paper, without a driver (or user-in-charge) the vehicle needs some means to check that it is receiving appropriate instructions and differentiate between an authorised person or some other party. It will need to be able to differentiate between legal instructions and nuisance or malicious signs that could lead to danger. Developers will need to consider how human drivers would respond and either replicate or improve on the response. As well as wearing uniforms all Police Officers almost universally carry police radios which have digital identities, so it is possible that the AV could verify the officer's ID and maybe also be forewarned as it approaches.

(3) In our view if any seatbelts or safety restraints are not properly secured then the vehicle should be immobilised.

The technology currently exists and could be adapted for child seats. Again, safety standards will need to be updated cover the requirements of child seats meant for AVs. As noted in the document, there could be issues with verifying the child's age and that the correct restraint is applied. Taking account para 7.84 in the consultation paper, it seems reasonable to argue that any child below the age 12 (or over 135cm tall) should be accompanied by a responsible adult. I.e. it is adult's responsibility to ensure young children are not in such AVs unaccompanied.

Consultation Question 31: We seek views on whether there is a need to reform the law in these areas as part of this review.

Please share your views: :

As noted in the answer to Q30 we support the view in para 7.79 for selected issues, i.e. "An alternative approach would be to postpone consideration of the issue until after highly automated vehicles have completed road trials and are ready to be put on the market, at which stage we will have more understanding of the practical issues."

In the short-term we suggest that the AV certification and approvals process should include demonstration that adequate measures are in place to replicate any duties of a human driver relating to safety and following an accident. Then the experience gained can be used to inform what reforms will be needed.

It does seem that further reforms will be needed to clarify liability when things go wrong.

Consultation Question 32: We seek views on whether there should be a new offence of causing death or serious injury by wrongful interference with vehicles, roads or traffic equipment, contrary to section 22A of the Road Traffic Act 1988, where the chain of causation involves an automated vehicle.

Yes, new offence

Please explain your answer: :

Yes, this should be updated. Law and policy should adapt to technology, especially in this area as there is huge potential for economic loss or loss of life.

The consultation paper seems to suggest that the existing law as it stands is neither consistent or clear for non-technology related offences. Whilst outside of the immediate terms of reference should this be used as an opportunity to tidy up existing legislation?

It also seems reasonable to suggest that AVs and ADS should include features to assist in identification of causation, such as making use of records from in-built camera and sensors, logs of software/coding changes.

Consultation Question 33: We seek views on whether the Law Commissions should review the possibility of one or more new corporate offences, where wrongs by a developer of automated driving systems result in death or serious injury.

Yes, review new corporate offences

Please explain your answer::

The developers must be driven by safety rather than cost. If a developer prioritises cost over safety as low as reasonably practical (ALARP) there should be proportionate penalties.

The law should be framed to prioritise safety over cost and encouraged developers to be honest, open and collaborative. There should be a safety culture where all parties are encourage to improve safety.

Chapter 8: Interfering with automated vehicles

Consultation Question 34: We seek views on whether the criminal law is adequate to deter interference with automated vehicles. In particular:

Yes

Please explain your answer: :

As the level of connectivity of vehicles increases, cyber security is becoming an increasing concern. There is more vulnerability to cyber incidents. Interference here is not a physical being interference but digital interference which can affect the AV's future path. Therefore, the law will need to be amended to include the digital side of interference but physical interference aspects could stay the same.

However, would it be more useful to remove any distinction in the type of interference? Is it better to say that an offence / criminal act has been committed if anyone intentionally changes or interferes with the vehicle function without lawful authority or reasonable cause if it is likely to cause danger or harm?

It is foreseeable that in some instances the vehicle owner could attempt changes to the software, code or sensors just as they do today eg in "chipping" cars. There could be many motivations for this, such to enable perceived higher performance by enabling the vehicle to travel above the speed limits, accelerate faster, tighter cornering or reduce gap between vehicles (tailgate).

As described in the Consultation paper it is not clear that current legislation for interference, tampering or hacking can be applied to AVs.

Again, the in-vehicle technology, cameras and sensors should be required to provide functionality to record and provide supporting evidence of interference. In many cases it could well be possible to disable the vehicle if it detects that it is in an unsafe/ non-approved state. That is providing there is clarity on liability:

- If there has been interference/ tampering the ADSE should not be held liable for the failure of the ADS to detect the infraction.
- Equally the ADSE should be encourage/incentivised to carry out all reasonable measures to detect interference.

Yes

Please explain your answer: :

See above.

Consultation Question 35: Under section 25 of the Road Traffic Act 1988, it is an offence to tamper with a vehicle's brakes "or other mechanism" without lawful authority or reasonable cause. Is it necessary to clarify that "other mechanism" includes sensors?

Other

Please explain your answer: :

The consultation paper identifies that there is not a definition of a mechanism and suggests that the term mechanism could be interpreted to include sensors. Whilst that may be the case the term sensor is not explicitly used. In addition, is it assumed that built in cameras are considered as sensors?

Would it be better to replace "mechanism" with a much broader term, such as "functioning system"? If the existing law is to be changed, we suggest that similar broad definitions are used to ensure all elements (whether physical or software code) that make up the functioning AV are included.

Consultation Question 36: In England and Wales, section 12 of the Theft Act 1968 covers "joyriding" or taking a conveyance without authority, but does not apply to vehicles which cannot carry a person. This contrasts with the law in Scotland, where the offence of taking and driving away without consent applies to any motor vehicle. Should section 12 of the Theft Act 1968 be extended to any motor vehicle, even those without driving seats?

Yes

Please explain your answer::

Ultimately, it will be possible to "joyride" a motor vehicle digitally, without being in it. Therefore, if the vehicle has no driving seat, it can be "joy-ridden" anyway. As a matter of fact, it also wouldn't matter the size of the vehicle (it could be a miniature delivery pod), as this could also be hacked digitally and joy-ridden. Therefore, it's important that the law is extended to any motor vehicle, especially seeing as a significantly higher proportion of vehicles will not have driving seats.

Consultation Question 37: In England and Wales, section 22A(1) of the Road Traffic Act 1988 covers a broad range of interference with vehicles or traffic signs in a way which is obviously dangerous. In Scotland, section 100 of the Roads (Scotland) Act 1984 covers depositing anything on a road, or inscribing or affixing something on a traffic sign. However, it does not cover interfering with other vehicles or moving traffic signs, even if this would raise safety concerns. Should section 22A of the Road Traffic Act 1988 be extended to Scotland?

Yes

Please explain your answer::

Yes, even more so in an autonomous vehicle context. This is because interference with the AV could occur in Scotland, but the effects of that interference could be seen in England or Wales. There could be timed digital interference, and this highlights the need for the laws to be updated in parallel. Also, traffic signals and communications systems need to be added to this. Signs are 19th century.

Chapter 9: "Machine Factors" - Adapting road rules for artificial intelligence decision-making

Consultation Question 38: We seek views on how regulators can best collaborate with developers to create road rules which are sufficiently determinate to be formulated in digital code.

Please share your views :

Should automated vehicles ever mount the pavement?

This is the key area for us in ITS (UK), as we see that the "roads" side of autonomy has been neglected. The need is not just for regulators and developers to discuss this but roads authorities too (who have legal obligations such as the Traffic Management Act)

There are tension already between what road users do and the Highway Code. To get past a parked delivery van they will mount the kerb on two wheels. They don't indicate. They use the "wrong" lane to turn. They take the "wrong" route around roundabouts.

In terms of the specific use case of mounting the pavement it will depend on the local circumstances but the Lambda V project has identified that if this is not the case, there will be many local roads (especially built before 1940) that are too narrow with parking for a "standard" size CAV to access fully. So, it would have to stop and retrace its steps. This sounds unrealistic as CAVS ought to be routed away from these areas, but they are precisely the areas that need CAV deliveries, CAV MaaS pickup and drop off and CAV access (eg to schools). Simply banning access will reduce attraction of CAVs. This is a problem not seen as much in the US

We see the need for a "Digital Highway Code" that defines on a legal basis and for driver test:

- The behaviour of any vehicle (CAV or existing vehicle)
- The specific behaviour of a CAV
- The behaviour of an existing vehicle around a CAV

ITS (UK) would welcome a chance to explore this more with the Commission.

Consultation Question 39: We seek views on whether a highly automated vehicle should be programmed so as to allow it to mount the pavement if necessary:

Please tick any box that you think applies and explain your reasoning below::

See above. It is not as simple as one size fits all and 2) and 3) might be done safely and 4) may have to apply (eg in a narrow road).

Consultation Question 40: We seek views on whether it would be acceptable for a highly automated vehicle to be programmed never to mount the pavement.

Please share your views :

See above and photos available on request. If this is the case the vehicle may never be able to access certain roads UNLESS it mounts the pavement. A digital highway code would enable this and define when its acceptable.

Consultation Question 41: We seek views on whether there are any circumstances in which an automated driving system should be permitted to exceed the speed limit within current accepted tolerances.

Please share your views :

No, there are none, as per with human drivers

Consultation Question 42: We seek views on whether it would ever be acceptable for a highly automated vehicle to be programmed to "edge through" pedestrians, so that a pedestrian who does not move faces some chance of being injured. If so, what could be done to ensure that this is done only in appropriate circumstances?

Please share your views::

This is a complicated issue. How would the pedestrian know it is a CAV? In some cases, the CAV will wait a long time at a crossing unless it can edge out. This is almost new ground anyway. Situations where human drivers need to do this are very rare, probably confined to occasions when large arenas or sports grounds empty out, and have not been studied to our knowledge.

Mobility scooters for example go on road and on pavements. There may be useful information already from current trials where CAVs are mixing with pedestrians. e.g. in Milton Keynes. Speed limiting has to be one of the most important factors.

Consultation Question 43: To reduce the risk of bias in the behaviours of automated driving systems, should there be audits of datasets used to train automated driving systems?

Yes

Please explain your answer :

Yes, for the local issues highlighted above

Consultation Question 44: We seek views on whether there should be a requirement for developers to publish their ethics policies (including any value allocated to human lives)?

Yes

Please explain your answer :

Consultation Question 45: What other information should be made available?

Please share your views :

As above, a Digital Highway Code would bring roads and roads operators into the "system of systems" that a CAV must operate in.

Consultation Question 46: Is there any other issue within our terms of reference which we should be considering in the course of this review?

Please alert us to any other issues that we should consider: :

There is legislation around roads operation and obligations on Local Highways and Highways England (eg Traffic Management Act, Road Traffic Act, Driver Information Act 1989) that needs to be reviewed.

The roads and road technology side of the CAV operation needs more emphasis in the review and we would be delighted to assist here. ITS (UK) is the UK's independent membership association for those who work with transport technology, including public and private sector and academia. Our Connected Vehicles Forum contains a vast amount of relevant expertise on Connected and Automated Vehicles and we would be very happy to work with you further.